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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/615,141

07/09/2003

Raymond Reuven Boxman

27/216

8087

7590 01/19/2007  
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EXAMINER

MAYEKAR, KISHOR

ART UNIT

PAPER NUMBER

1753

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/19/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/615,141

Applicant(s)

BOXMAN ET AL.

Examiner

Kishor Mayekar

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 1-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 33-56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>09/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of invention of Group II, claims 33-56 in the reply filed on 27 October 2006 is acknowledged.

### *Claim Rejections - 35 USC § 102 and § 103*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 33, 37, 43, 44, 46 and 50 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ohsima et al. (US 5,482,601). Ohsima's invention is directed to a

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device for the production of carbon nanotubes comprises an electrode arrangement 2 having a surface; a counter-electrode 6, at least one of the electrodes including carbon, the electrodes being separated by a gap; and an electrical voltage supply configured to produce an electrical discharge in the gap to form at least one carbon nanotube in a first region of the surface (see Fig. 1; col. 2, line 47 through col. 3, line 30; and col. 4, lines 1-31).

As to the subject matter of claim 37, it is inherently in Ohshima's teachings when a drive mechanism 5 is continuously operated to rotate the electrode arrangement 2.

As to the subject matter of claims 43 and 44, it is inherently in Ohshima's teachings when considering the rod-shaped counter electrode 6 having a tip end 6a.

As to the subject matter of claim 46, Ohshima's position adjuster 7 is the recited electrical sensing apparatus.

5. Claims 35, 39 and 40 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ohshima '601. Ohshima as applied above discloses a helium-containing atmosphere (col. 4, lines 10-20) and carbonaceous material for the electrodes (col. 2, lines 50-52 and col. 3, lines 1-4). To the subject matter of each of the above claims, it has been held that the disclosure in the prior art of any value within the claimed range is an anticipation of that range, *Titanium Metals Corporation of America v. Banner*, 227 USPQ 773. And a prima facie case of obviousness

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exists in the case where the claimed range overlaps range disclosed by the prior art, *In re Wertheim* 191 USPQ 90.

6. Claims 34, 36, 38, 41, 42, 45, 47-49 and 51-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima "601 in view of Takikawa et al. (US 6,759,024 B2). The difference between Ohshima as applied above and the instant claims are the limitation recited in each of the instant claims. Takikawa shows in an apparatus for the production of carbon nanotube by arc discharge that an electrode arrangement of graphite is preferably with a range of between 1mm and 7mm (col. 6, lines 59-65); the arc discharge is produced in air atmosphere in addition to helium atmosphere (col. 6, lines 28-54); the movement between electrode arrangement and the counter-electrode (col. 9, lines 19-40); and the arc discharge is carried out by means a DC, a DC pulse, an AC or an AC pulse (col. 8, lines 45-50) with a current between 5 to 500 A (col. 7, lines 50-52). As to the recited counter-electrode as a cathode, it would be in Takikawa's teachings when the electrical discharge is by means of an AC pulse. As to the subject matter of claims 34 and 53, a prima facie case of obviousness exists in the case where the claimed ranges and prior art ranges do not overlap but are closed enough. As to the subject matter of other claims, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Ohshima's teachings as shown by

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Takikawa because the selection of any of known equivalent arc discharge for the production of carbon nanotubes would be within the level of ordinary skill in the art.

As to the subject matter of claim 45 or 49, the selection of the form of the counter-electrode would be within the level of ordinary skill in the art.

As to the subject matter of claim 48, the selection of any of known equivalent arrangements for feeding an end of the counter-electrode towards the electrode arrangement would be within the level of ordinary skill in the art.

### *Conclusion*

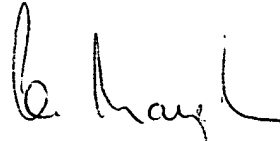
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (571) 272-1339. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on

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access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Kishor Mayekar', is positioned above the printed name.

Kishor Mayekar  
Primary Examiner  
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